STATEMENT OF WORK
FOR
SIMULTANEOUS IMAGERY ACQUISITION STATION
(SIAS)

1.0 BACKGROUND

1.1 Often during testing and development, in the quest to reduce the signature of an item in one threat band, the signature of that item is increased in another threat bank. New signature reduction technology is feasible only if it "…does no harm…" to its signature in other threat bands. This problem can only be identified if the item is managed simultaneously, using sensors that function in the known threat bands. This prevents erroneous data due to changes in the environment or lighting conditions.

1.2 The NRL/STO required the ability ot simultaneously scan and acquire spectral imagery in the 0.38μ to 13.5μ range. This ability shall be compatible for use in the laboratory as well as in the field. The required system shall be integrated into a single unit that allows a single operator to simultaneously acquire imagery in the visual, Near Infrared (NIR), and Infrared (IR) bands. The Simultaneous Imagery Acquisition Station (SIAS) will allow the STO to quickly and accurately characterize past and future signature management technologies to determine their strengths and weaknesses.

2.0 SCOPE

2.1 This Statement of Work (SOW) addresses the development of an imaging system that is capable of, but not limited to, simultaneously capturing video footage in the known threat bands: 1.) Visual in High Definition resolution; 2.) NIR (I^2) utilizing GEN III technology; 3) Mid-Wave Infrared (MWIR); and 4) Long Wave Infrared (LWIR).

2.2 The required detectors shall be integrated into a single system using an integrated monitoring and control station.

2.2.1 The required station shall display the data from each detector.

2.2.2 The required station shall allow the operator to control the position of each detector individually or in unison, at the operator's discretion, from a single workstation.

2.2.3 The required station shall include a video processing unit that will allow the imagery from each of the integrated units to be simultaneously displayed on a high definition display of at least 26" to allow the operator to view the images of the item in the known threat bands.

3.0 SYSTEM REQUIREMENTS

The Contractor shall design, develop and deliver a system that meets or exceeds the following specifications.

4.0 DIGITAL VISUAL CAMERA UNIT (DVCU)

4.1 The Contractor shall furnish a DVCU with at least the following characteristics:

4.1.1 High Definition Recording Capability

The required DVCU shall provide both of the following high definition recording capabilities:

1) 720/30P (MPEG2)
2) 480/60P (MPEG2)

4.1.2 High Definition Playback Capability

The required DVCU shall provide all of the following high definition playback capabilities:

1) 1080/60I
2) 720/60P
3) 480/60isn
4.) 480/60 4:3

4.1.3 The DVCU shall be capable of Standard Definition Recording/ Playback.

4.1.4 The DVCU shall have a sensitivity that meets or exceeds F8 @ 2000 lux (HD mode)

4.1.5 Zoom

The required DVCU shall provide all of the following Zoom capabilities:

1) At least 10x optical zoom
2) At least 40x SD/DV
3) At least 200x digital zoom

4.1.6 Lens

The required DVCU shall have a standard lens that meets the following specifications:

1) F1.8 – F1.9
2) f=5.2mm – 52.mm

4.1.7 Detector

The required DVCU shall have an image detector that meets or exceeds the following specifications:

1) Single 1/3-inch 1.18 Mega-pixel progressive scan CCD.

4.1.8 Still Image Capture
The required DVCU shall provide of 16:9 still image capture using MPEG-4 clip capture with an SD memory card.

4.1.9 Viewfinder
The required DVCU shall have a Flip-Out type LCD Viewfinder that meets or exceeds 180K pixel color.

4.1.10 Input/Output Connections
The required DVCU shall, at a minimum, include the following input/output connections:

1.) i.link IEEE 1394;
2.) composite S-video;
3.) Y/C.

4.1.11 Power
The required DVCU shall be able to function either on DC via an AC Adapter (which shall be included with the camera), or DC via a rechargeable lithium battery pack (which shall be included with the camera), at the discretion of the Government operator. A battery charger that is functionally and operationally compatible with the required battery pack shall be furnished with the DVCU.

5.0 NIGHT VISION UNIT GEN III (NVUGIII)

5.1 The Contractor shall furnish a NVUGIII with at least the following minimum characteristics:

5.1.1: The required NVUGIII shall utilize High Performance GEN III, aviation, OMNI V tube. The required tube shall be capable of at least 72-line pair resolution.

5.1.2: The required NVUGIII shall be mounted to a camera unit that shall have the following minimum characteristics:

1) The camera unit shall possess a CCD with a minimum of 1.5 Mega Pixels.
2) MPEG movie mode
3) USB Interface
4) A minimum resolution of 520 lines of horizontal video resolution
5) The camera unit shall have, at a minimum, 10x Optical Zoom capability and 120x Digital Zoom capability.
6) At least a 2.5" LCD Display
7) A 1394 interface

8) Focal Distance of 4.2 – 42mm
9) A rechargeable lithium battery and an AC adapter, both of which shall be provided with the NVUGIII, and both of which shall be functionally and operationally compatible with the NVUGIII.

5.1.3: The Contractor shall provide a rigid, durable waterproof storage case for the NVUGII with the SIAS.

6.0 MWIR IMAGER UNIT (MWIRIU)

6.1 The Contractor shall furnish a MWIRIU with at least the following minimum characteristics:

6.1.1 Optical Configuration
The required MWIRIU shall have dual eye ports, configured like binoculars.

6.1.2 Display Capability
The required MWIRIU shall have an integrated LCD screen with a minimum resolution of 800 x 600.

6.1.3 Input/Output Connections
The required MWIRIU shall, as a minimum, possess the following I/O connections:
1) RS-170, and
2) RS-232 or RS-422

The Contractor shall also provide a 9m communication cable functionally and operationally compatible with either the RS-232 or RS-422, whichever is offered.

6.1.4 Detector
The required MWIRIU shall utilize 3rd generation, 320x240 Indium Antimonide (InSb) Focal Plane Arrays (FPA). The FPA shall be operational in the 3μ - 5μ bandwidth. The FPA shall be cooled using a closed-cycle Sterling micro-cooler.

6.1.5 Field of View
The required MWIRIU shall be capable of dual Field of View that meets or exceeds the following specifications:
1) Wide Field of View (WFOV), 11"(h) x 9" (v)
2) Near Field of View (NFOV), 3.7" x 2.9"

6.1.6 Magnification
The required MWIRIU shall have at least 2X magnification capability by the addition of lenses that shall be supplied with the SIAS.

6.1.7 Integrated Laser Rangefinder

The required MWIRIU shall have an integrated laser rangefinder that meets or exceeds the following range requirements: 30 – 5000 meters

6.1.8 Integrated Digital Magnetic Compass

The required MWIRIU shall have an integrated digital magnetic compass that meets or exceeds the following specifications:

1) Azimuth Accuracy: 1.0 ^{o}
2) Elevation Accuracy: 0.5 ^{o}

6.1.9 Integrate GPS

The required MWIRIU shall have an integrated GPS that meets or exceeds the following specifications:

1) Self and Target Position Solving
2) Active Internal Antenna

The Contractor shall provide support for the external antenna.

6.1.10 Power

The required MWIRIU shall be able to function using either two (2) D-size Lithium or Li-ion batteries, or a 12V – 32V AC-DC adapter, at the discretion of the Government operator. The Contractor shall provide both the required batteries and the AC-DC adapter. The Contractor shall also provide a Battery Charger that is functionally and operationally compatible with the batteries provided.

6.1.11 Carrying Case

The Contractor shall provide a rigid, durable waterproof storage case for the MWIRIUI with the SIAS.

7.0 LWIR IMAGER UNIT (LWIRIU)

7.1 The Contractor shall furnish a LWIRIU with at least the minimum following characteristics:

7.1.1 Imaging Performance

Imaging Performance for the required LWIRIU shall be Composite Color in NTSC (RCA jack)/

7.1.2 Lenses

The Contractor shall provide Standard Lens and 3X Magnification Lens for the required LWIRIU.

The required Standard Lens shall have a standard FoV of 24 degrees x 18 degrees, and a minimum focus distance of no greater than 0.3 meters.

The required 3X Magnification Lens shall have a FoV of 7 degrees x 5.3 degrees, and a minimum focus distance of no greater than 4.0 meters,

The required LWIRIU shall be capable of both Automatic and Manual focusing at the discretion of the Government operator.

7.1.3 Detector Type

The LWIRIU shall utilize an uncooled, InSb Focal Plane Array (FPA) microbolometer. The resolution of the detector shall meet or exceed 320x140. The required detector shall function in the 7.5μ - 13.0μ band.

7.1.4 External Display

The required LWIRIU shall, as a minimum, have a 4", full color, LCD with a resolution of no less than 800x600.

7.1.5 Input/Output Connections

The required LWIRIU shall, as a minimum, possess the following I/O connections:

1) RS-170 EIA/NTSC
2) Composite Video
3) S-Video, and
4) USB and RS232

7.1.6 Data Storage

The required LWIRIU shall be capable of storing a minimum of 50 images in internal data storage. The LWIRIU shall also have removable, external data storage of at least 128 MB in size. The required LWIRIU shall utilize standard JPEG format for thermal and visual images, and shall be capable of linking thermal images with corresponding visual images.

7.1.7 Laser Designator

The required LWIRIU shall have a Class 2 semiconductor A1GainP diode, red laser equivalent to a wavelength of 635 nm.

7.1.8 Power

The required LWIRIU shall be capable of running directing from AC and VDC power supplies, at the discretion of the Government operator, using power configurations that meet or exceed the following specifications:

The Contractor shall supply the necessary cables and batteries required to operate the LWIRIU directly from AC and VDC power supplies. The required VDC power components shall consist of Lithium Batteries and a battery charger functionally and operationally compatible with the required batteries.

The Contractor shall also supply an AC adapter and a 12 VDC power supply for the required LWIRIU.

7.1.9 Software

The required LWIRIU shall include any software necessary to allow the camera to communicate with a computer.

7.1.10 Carrying Case

The Contractor shall provide a rigid, durable waterproof storage case for the LWIRIU with the SIAS.

8.0 SUPPORT AND INTEGRATION STATION

8.1 The Contractor shall furnish a support and integration station with at least the following minimum characteristics:

8.1.1 Tripods

The Contractor shall furnish Four (4) tripods with the required SIAS.

8.1.2 Pan and Tilt

The Contractor shall furnish Four (4) Pan and Tilt units with the required SIAS. Each Pan and Tilt unit shall be capable of supporting at least 35 pounds. The Pan and Tilt units shall be capable of being controlled either independently or in unison at the discretion of the Government operator.

8.1.3 Integrated Monitoring and Control System

The Contractor shall provide a single Integrated Monitoring and Control System (IM&CS) with the required SIAS. As a minimum, the required IM&CS:

1) Shall be housed in a durable locking case;
2) Shall have four (4) integrated monitors to allow viewing of data from each detector;
3) Shall be able to control the pan and tilt units individually or in unison at the discretion of the Government operators;
4) Shall be a wired system; and
5) Shall have four (4) separate video outputs for separately recording data from each detector.

8.1.4 Recording Units

The Contractor shall provide four (4) separate media storage units with the required SIAS. As a minimum, the required media storage units shall meet the following requirements.

1) Shall utilize removable PC-Card (PCMCIA) flash disks.
2) Shall utilized 6-15 V DC power.
3) Shall be capable of time/date stamp.
4) Shall be capable of real-time MPEG-2 compression.

5) The required media storage units shall also be capable of storing both movies and still images at the Government operator's discretion.
6) The storage drives shall be able to store video files as to be accessed by Windows Media Player and other MPEG-2 players.
7) Contractor shall provide the following items with the storage drives.
   a. All necessary cables to connect the storage drive to a PC with a PCMCIA drive.
   b. All necessary software for archiving files to a DVD for viewing on a standard, commercial DVD player.
   c. All necessary software to allowing video processing and editing on a PC.

9.0 LCD VIDEO DISPLAY (LCDVD)

The required SIAS system shall digitally displaying video footage from the DVCU, MWIRIU, NVUGIII, and LWIRIU simultaneously. The required SIAS system shall utilize a flat panel LCD TV with at least the following minimum specifications:

9.1 Digital Capacity

The require LCDVD shall have High Definition (HD) capabilities.

9.2 Size

The required LCVDV shall have a minimum diagonal display of 26" for the viewable screen.

9.3 Input Signals

The required LCDVD shall be capable of accepting the following signal resolutions:

1) 480i
2) 480p
3) 720p
4) 960i, and
5) 1080i

9.4 Aspect Ratio

The native screen mode of the required LCDVD shall be capable of a 16:9 screen aspect ratio.

9.5 Input/Output Connections

The required LCDVD shall, as a minimum, have the following connectors:

1) S-video
2) Component Video
3) Composite Audio/Visual
4) RF coaxial

10.0 APPLICABLE DOCUMENTS/SOFTWARE MEDIA

The Contractor shall furnish all software to provide for a fully functional and operational system. The Contractor shall deliver back-up media for all software delivered with the system. The Contractor shall also deliver all required manuals for the individual components comprising the SIAS.

11.0 DELIVERY/CERTIFICATION/SET-UP/TRAINING

11.1 The Contractor shall make delivery of all requirements not later than 24 weeks after contract award.

11.2 The Contractor shall provide certification of compliance in accordance with the published specifications. The Contractor shall provide test data to document the performance levels of each detector and to demonstrate that each detector meets or exceeds the requirements outlined in this SOW. The required data shall be delivered to the designated Contracting Officer's Representative (COR) 30 days prior to delivery of the complete system.

11.3 Delivery of the system shall be F.O.B. Destination, with all shipping expenses paid by the Contractor.

11.4 The Contractor shall provide set-up and training for Government employees at NRL no later than 30 days after delivery of the system. After system set-up, the Contractor shall test all of the system's capabilities and demonstrate the ability of the system to comply with specified performance. Test data resulting from this test shall be provided to the COR.

12.0 TECHNICAL SUPPORT

The Contractor shall provide telephone/fax/e-mail technical support for a period of 1 year from system inspection and acceptance. The Contractor shall also provide four (4) on-site technical help and trouble shooting visits for a period of 1 year from inspection and acceptance of the required system.

13.0 WARRANTY

The Contractor shall warranty parts and labor on the required system for a period of 1 year following system inspection and acceptance. The Contractor shall pay all shipping expenses associated with warranty repairs during the warranty period.

14.0 FULLY OPERATIONAL, FUNCTIONAL AND INTEGRATED SYSTEM

14.1 The Contractor shall provide a fully operational, fully functional, and fully-integrated system.

14.2 For the purpose of this solicitation, a fully operational, fully functional, fully integrated system is defined as a family of sub-elements (materials, parts, assemblies and subassemblies, components and subcomponents, hardware, software, firmware, etc.,) which, when assembled, form an integrated complex whole that is structured so that its constituent parts perform in a functionally and operationally compatible manner.